

Application No. 10/055,797

AMENDMENTS

IN THE CLAIMS:

Please amend Claim 1 and add new Claims 37-39 as follows:

1. (Currently Amended) A system for launching a projectile to remove a body of rock in an excavation, comprising:

a projectile that includes:

- a nose, the nose being one of substantially flat and concave to inhibit deflection of the projectile from a face of the rock;
- a body containing an explosive charge; and
- a tail having a plurality of transversely oriented fins to control the trajectory of the projectile; and
- a tube for launching the projectile.

2. (Original) The system of Claim 1, wherein the body contains a detonating device, the detonating device having a primer in a proximal end and a striker in a distal end, the striker and primer being separated from one another by a spring member which forces the striker away from the primer and a safety pin which restricts the motion of the striker towards the primer.

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3. (Original) The system of Claim 1, wherein the tube includes a cavity at a bottom of the tube for containing a propelling charge for launching the projectile from the tube.

4. (Original) The system of Claim 3, further comprising:
a pusher plate located between the propelling charge and the bottom of the projectile, the top of the pusher plate being in contact with the bottom of the projectile for pushing the projectile out of the tube when the propelling charge is ignited.

5. (Original) The system of Claim 4, wherein the clearance between the outer perimeter of the pusher plate and the inside of the tube is relatively small to substantially seal gases from the ignited propelling charge in the cavity and thereby form a gas pressure differential on opposing sides of the pusher plate, with the gas pressure on the bottom of the pusher plate being greater than the gas pressure on the top of the pusher plate.

6. (Original) The system of Claim 4, wherein the bottom of the pusher plate is concave.

7. (Original) The system of Claim 1, wherein the explosive is selected from the group consisting of TNT, PETN, RDX, HMX, ammonium nitrate-based explosives, and mixtures thereof.

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8. (Original) The system of Claim 1, wherein the tube includes a receiver/transmitter for receiving a control signal from a transmitter and transmitting a second control signal to a receiver in the projectile.

9-26. (Cancelled)

27. (Withdrawn) A method for removing a body of rock in an excavation, comprising:

aiming a launch tube containing a projectile such that the projectile impacts a target area on the body of rock after launching;

5 transmitting a control signal to a receiver from a remote location to cause at least one of the following to occur: launching of the projectile and arming of the projectile;

launching the projectile from the tube; and

contacting the nose of the projectile with the target area.

28. (Withdrawn) The method of Claim 27, further comprising:

when the projectile is launched, transmitting a second control signal to a counter;

when the counter determines that a predetermined time interval is reached,

generating a third control signal to perform at least one of the following steps:

5 arming a detonating device in the projectile and

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initiating the detonating device to ignite an explosive charge in the projectile.

29. (Withdrawn) The method of Claim 27, wherein further comprising;
moving a striker in a detonating device in the projectile forwardly against a
resistance of a spring member; and
impacting a primer with the front portion of the striker to initiate the primer,
5 thereby initiating a detonator and thereby initiating an explosive charge contained in the
projectile.

30. (Withdrawn) The method of Claim 27, wherein further comprising;
converting the control signal into electrical energy and
when a predetermined amount of electrical energy is generated in the converting
step, transmitting the electrical energy to a firing device to initiate the launching step.

31. (Withdrawn) The method of Claim 27, wherein further comprising;
converting the control signal to electrical energy and
when a predetermined amount of electrical energy is generated in the converting
step, transmitting the electrical energy to activate a device to pre-arm or arm an ignition
5 device in the projectile.

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32. (Withdrawn) The method of Claim 27, wherein a velocity of the projectile during flight ranges from about 25 m/sec to about 250 m/sec.

33. (Withdrawn) The method of Claim 27, wherein the nose of the projectile is blunt to inhibit deflection of the projectile from angled surfaces.

34. (Withdrawn) The method of Claim 27, wherein the aiming step comprises positioning a radiation emitting device on the tube and thereafter aligning a beam of radiation from the radiation emitting device with the target.

35. (Withdrawn) A method for removing a body of rock in an excavation, comprising:

aiming a launch tube containing a projectile such that the projectile impacts a target area on the body of rock after launching;

5 launching the projectile from the tube;

when the projectile is launched, transmitting a control signal to a counter; and

if the counter determines that a predetermined time interval has elapsed,

generating a second control signal to initiate the detonating device to ignite an explosive charge in the projectile.

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36. (Withdrawn) The method of Claim 36, further comprising transmitting a third control signal to a receiver from a remote location to cause at least one of the following to occur: launching of the projectile and arming of the projectile.

37. (New) The system of Claim 1, wherein said nose is concave.

38. (New) The system of Claim 1, wherein said nose is substantially flat.

39. (New) The system of Claim 1, wherein said nose has a diameter that is about equal to a maximum diameter of said projectile.